

In the first chapters we have a brief but accurate summary of the history of gold from the earliest times, followed by an account of the properties of the metal and its compounds of special value to the metallurgist. The important subject, the alloys of gold, is treated at greater length in the fourth chapter, which is one of the most valuable parts of the book, and contains an account of these alloys, brief, it is true, but no essential points have been overlooked. The attention of the metallurgical student is especially called to this chapter, as it forms a comprehensive introduction, such as is not found elsewhere, to the detailed study of these interesting mixtures of gold with other metals. The constitution of these alloys, according to modern views, as deduced from freezing-point curves and micro-structure, is ably and clearly explained. In the subsequent chapters dealing with gold, the occurrence of the metal in nature and the methods of extracting it from ores are dealt with. Commencing with the simplest and most primitive method of extraction, that of simple "washing" practised from the earliest times and culminating in the modern system of "dredging," the various processes of amalgamation are passed in review, and, finally, the so-called "wet" processes are considered. Of the latter, the cyanide process, to which we owe the extraordinary production of gold in the Transvaal, is dealt with at considerable length in the eighth chapter.

Silver, now of much less importance than gold, since it is no longer in use for the standard coinage of most countries, occupies only about half the space given to the nobler metal.

The alloys, compounds, and ores of silver are first discussed, and then methods of extraction. The important methods are described, and even those which have become, or are becoming, obsolete receive fitting attention. The time-honoured *patio* process in Mexico, where the climate and other conditions were specially favourable for its success, which has produced many millions sterling of the metal, has evidently had its day, is being replaced by the modern cyanide process, and is now mainly of historical interest. The same is true of other "wet" processes in many silver-producing districts.

An entire chapter is devoted to the processes employed in the refining of gold and silver, operations dealing annually with enormous values. Thus gold to the value of 50,000,000*l.* is refined every year by the sulphuric-acid process, 12,000,000*l.* by the chlorine process, and about 4,000,000*l.* by electrolysis.

The chapters on assaying, minting, and the manufacture of gold and silver wares are written with great clearness, and give the best brief and trustworthy account which has yet been published on these subjects. They will be read with interest by both technical and non-technical readers. Platinum, although not usually included in the term "precious metals," yet, being in common use and more valuable weight for weight than gold, has been rightly given a place in the book. The condensed account given of it deals with its occurrence, properties, alloys, extraction, purification, and assay.

The volume concludes with a series of statistics relating to the production and consumption of the precious metals.

The accounts of the various operations by which these metals are extracted from their ores and refined or adapted for minting or industrial use, although brief, are clear and accurate, and the essential points in each process on which its success depends are carefully set forth. A valuable feature, too, is the chemical reactions and changes which occur in the operations, and the principles on which they are based, which appear under each metal.

Dr. Rose is to be congratulated on his book. He has succeeded in compressing within the limits of 295 pages an excellent summary of the metallurgy of gold, silver, and platinum, marvellous in conciseness, quite up-to-date, and without the omission of anything of serious importance.

It deserves many readers, and can be strongly recommended to metallurgical students, by whom it can be studied with advantage before or at the same time as the larger text-books.

W. G.

FLOWER CULTURE.

Beautiful Flowers and how to Grow Them. By Horace J. Wright and Walter P. Wright. Pp. 198. (Edinburgh: T. C. and E. C. Jack, n.d.) Published in seventeen parts at 1*s.* each, or two volumes at 10*s.* 6*d.* each.

THIS work will take a high place amongst recent publications dealing with the popular and fascinating art of floriculture. The authors have made a selection of the best and most beautiful flowers for cultivation in the garden and greenhouse. These flowers, numbering 100 in all, are illustrated in full-page coloured plates, which are excellent reproductions of flower paintings by such well-known artists as Beatrice Parsons, Eleanor Fortescue Brickdale, Anna Lea-Merrett, Hugh L. Norris, Lilian Stannard, Margaret Waterfield, A. Fairfax Muckley, and Francis E. James.

Such a collection affords a very valuable guide to amateurs as to which flowers are likely to give them most pleasure, and, in the majority of cases the kinds presented will be found amply sufficient for their study; but, not only so, the plates will prove useful in two further directions. In the first place, many of the pictures depict the particular flowers grouped with other kinds with which they harmonise perfectly in the garden, and, in the second place, as the paintings were in most cases prepared from first-class specimens, they set before the amateur a high standard of culture he will do well to emulate. Both these lessons are given in such plates as a "Bed of La France Roses," "Dwarf and Climbing Roses, with Zonal Geraniums," "Madonna Lily (*Lilium candidum*) and Roses," "Pyrethrums and Lupins," "Foxgloves and Poppies," "Asters, Phloxes and Sweet Peas," "Hippeastrums," "Single Dahlias," "Rosé-arch and Campanulas," "Hardy Chrysanthemums," and "Water Lilies." In certain others a supremely satisfactory result is obtained by showing a single plant depicted in all its glory, such, for instance as

"Fibrous-rooted Begonia," in which the peculiar form and colour of a well-flowered plant are clearly set forth; *Lycaste Skinneri*, *Masdevallia Harryana*, and *Paphiopedilum (Cypripedium) Curtisii*.

It will be seen that orchids are well represented; indeed, the subjects are selected from almost every class of flowering plant; even the window garden is not forgotten, but, on the contrary, one of the plates illustrates a window-box filled with suitable plants in full flower. It can be said of only a small number that they fail to rank with the best, and in these few cases the original drawings were insufficiently definite in character or the plants depicted were scarcely satisfactory specimens.

So far we have referred only to that portion of the work which answers to the first half of the title, namely, "Beautiful Flowers," but in the text the second half of the title is justified, "How to Grow Them." The authors, being well familiar with their subjects, have related in pleasant, but plain, language all the details of cultivation that are necessary to enable the merest amateur to obtain success. It is satisfactory to note that this is done without the petty gossip and extraneous information that mar so many modern gardening books. In short, the writing, though pleasantly entertaining, is serious, and its main object, namely, that of imparting information, is always kept in mind. Part i. is exclusively devoted to the rose, which is treated at greater length than most of the subjects. Carefully compiled lists of roses specially suitable for particular forms of culture will save the amateur a great amount of research in catalogues, which is seldom satisfactory unless the cultivator has already considerable knowledge of the habits of the different types. Roses are followed by chapters on bulbs, which extend into part iii. Then follows a long article on hardy herbaceous plants, these being amongst the popular flowers of the day.

In part vi. herbaceous plants give place to rockery plants, and these to greenhouse and stove plants. In succeeding parts articles are devoted to sweet peas, carnations, dahlias, chrysanthemums, and all the most beautiful garden flowers, until near the end we come to the floral aristocrats, the orchids. There is a good index, and, in addition to the coloured plates, there are line drawings inserted in the text for the purpose of illustrating some of the cultural processes, such as budding, grafting, and other systems of propagation, also potting, tying, &c. The publishers may be congratulated on the excellent type and the general good appearance of this book, which is suitable for the drawing-room table.

BRITISH CATTLE.

The Evolution of British Cattle and the Fashioning of Breeds. By Prof. James Wilson. Pp. viii + 147. (London: Vinton and Co., Ltd., 1909.) Price 7s. 6d. net.

THE author of this book exhibits a considerable knowledge of the literature which bears upon the subject of the origin and development of British cattle. His references range from Cæsar's Gallic war to Thomson's recent book on heredity; they embrace

not only husbandry in the old and agriculture in the new sense, but political and social history, and such details of the modern sciences of palæontology and Mendelism as are necessary for his purpose. Thus a knowledge of the habits of the peoples dealt with and of the circumstances affecting them at various times is brought to bear upon the problem of the migration of cattle and of the blending of different breeds in olden days, while the evidence he has culled from various writings of the seventeenth and eighteenth centuries is especially noteworthy and valuable to the student of heredity, inasmuch as it throws light on the causes which influenced the establishment of modern breeds during a period of which but little is generally known of stock breeding.

In his opening words the author asserts that it will be his duty to question and sometimes to destroy many fondly cherished beliefs as to the origin, history and evolution of the cattle of these islands. We think he has fulfilled that duty in a clear and convincing manner, and not only so, but has succeeded, as he hoped, in placing before his readers a sounder knowledge of the subject.

After a chapter on *Bos primigenius*, in which he disposes of the evidence advanced to show that this species has ever been represented here, he quotes the work of many modern palæontologists to demonstrate that *Bos longifrons* is the species which was present in the Neolithic age, and was the original native breed. It was this black breed, he says, which was driven with their Celtic owners before the successive invaders of Britain, and remain till this day in Scotland, Ireland, Wales, Cornwall, and the north of England.

He then claims that with the Romans came the white cattle of Southern Europe, from which the wild white cattle found at the time of the Norman invasion and the present wild herds are derived. That with the Anglo-Saxons came the red cattle which dominated the south of England down to the eighteenth century, and of which our Lincolns, Devons, Herefords, Norfolks, Suffolks, and Sussex are the representatives; while with the Norse people came the polled cattle.

After the Norman conquest until the seventeenth century he believes there was but little migration of cattle about the country, and that not until later still was crossing of breeds at all freely carried on. What he calls the "Dutch invasion" of cattle in the seventeenth and eighteenth centuries, caused by England's sympathy with the Netherlands, gave rise to the first shorthorn blood, and, as at this time "landowners had become business men," great impetus was then given to breeding.

He then deals in an admirable manner with the production and evolution of the various breeds which exist to-day; he calls to his aid Mendel's theories, and shows their practical value for the elucidation of such complex problems.

Especially interesting are his chapters on the causes, natural and artificial, which stimulated or checked the spread of the Hereford, longhorn, shorthorn, and Aberdeen Angus breeds; on Bakewell, Charles Colling, Hugh Watson, and other great breeders, and how they all brought their special breeds to perfection, first